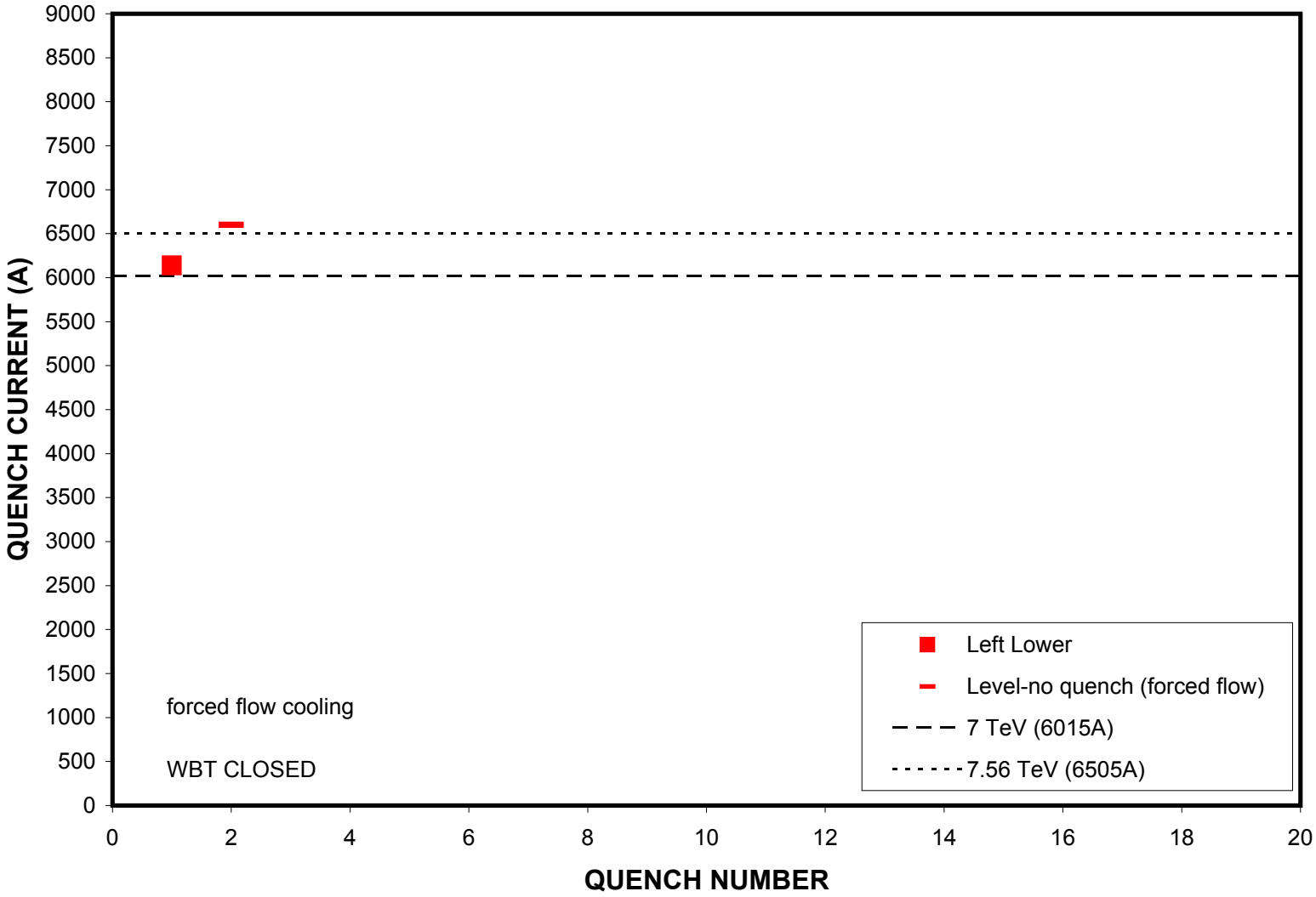
D4L101 QUENCH TESTS



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D4L101 QUENCH SUMMARY

Magcool Bay C

QUENCH #	RUN #	CURRENT (A)	T1 (K)	T3 (K)	START (ms)	MIITS	COIL	COMMENTS
T = 4.5K (nom)								
Warm bore tubes installed, sealed, and under vacuum								
Forced flow cooling @ 12atm								
1	15	6138	4.657	5.264	-40	9.3	lower left	
	16	6600	4.718	5.346	no quench; maintained level 1 hr			
Warm bore tubes open								
Magnetic field measurements to 6400A with no quenches								
Switched to liquid helium bath cooling @ 1.4atm								
Warm bore tubes sealed and under vacuum								
No quench tests performed due to cryogenic issues (h)								

Notes:
a) Ramp rate for quenches was 20A/s.
b) Energy extraction used: 35mohms for all quenches.
c) The temperature T1 is a diode sensor located in the helium return line tube which contains the superconducting bus; T3 is in the lower lead interconnect pot. Both have associated redundant sensors.
d) There were no auxiliary voltage taps in the magnet coils.
e) Data acquisition sampling rate was 1kHz for all quenches.
f) Strip heaters were fired at 475V (nom) and 96A (nom), with 1ms delay.
g) For all quenches, the voltage difference quench detector threshold voltage was set at 0.6V.
h) After magnetic field measurements were done, the cooling scheme was switched from forced flow supercritical helium cooling at 12 atm to liquid helium bath cooling at 1.4 atm. Normally we would perform at least one quench test with this type of cooling. In this case, we did not do this because the liquid helium refrigerator (HEUBE) was running with just one of its two engines. The other engine (E20) had a bad bearing and was not reliable. With one engine, the refrigerator, though adequate for forced flow cooling, was not able to keep up with the heat load of the magnet when using liquid cooling. After the initial filling of the cryostat with liquid, the liquid boiled off and the magnet warmed up to above 15K. Cooling after that was not good enough. It could not keep up with the heat load and liquid was not being made. The level probes had registered over 90% full during the initial fill and then showed the decrease as the boiloff took place, demonstrating that the level probes were functioning correctly. It was therefore decided that a quench in liquid was not necessary, since the proper operation of the level probes was observed. Testing was

therefore ended and magnet warmup was started. Level probe data, which verifies correct operation, is available.